Poster Exhibition

2. Nutrition, Education and Exercise for Obesity

PE 02-01 2. Nutrition, Education and Exercise for Obesity

Vitamin D levels in individuals with different phenotypes of prediabetes

Chunhua Wu[1], Qunyan Zhou[1]

[1] Department of Clinical Nutrition, The Affiliated Wuxi People's Hospital of Nanjing Medical University, Wuxi, People's Republic of China.

Background: Studies on vitamin D levels in individuals with different phenotypes of prediabetes are rare. This study aimed to examine the associations between vitamin D levels in adults with prediabetes and among individuals in different categories of prediabetes.

Methods: The data used in this study were obtained from the National Health and Nutrition Examination Survey (NHANES) 2011–2016. We classified participants as having an isolated prediabetes defect (impaired fasting glucose [IFG], impaired glucose tolerance [IGT], or glycosylated haemoglobin A1c [HbA1c] indicative of prediabetes [IA1c]), two defects (IFG+IGT, IFG+IA1c, or IGT+IA1c), or all defects (IFG+IGT+IA1c). The concentration of 25-hydroxyvitamin D (25(OH)D) in the serum was determined by standardized liquid chromatography-tandem mass spectrometry (LC-MS/MS).

Results: Vitamin D levels were lower in individuals with IGT+IA1C-defined prediabetes than in normoglycaemic individuals (45.85±15.35 vs. 56.6±21.74, P<0.01). Multivariate linear regression analysis revealed that compared with those in normoglycaemic patients, vitamin D levels were 9.023 lower in IGT+IA1C-defined prediabetes patients (95% CI: -15.165 to -2.882, P=0.004).

Conclusion: Vitamin D levels differed according to prediabetes phenotype, and IGT+IA1C might be a better predictor of lower vitamin D levels

Table 1. Linear regression analyses on the association of Prediabetes categories and vitamin D levels

	Sample size (n)	25OHD2+25OHD3 (nmol/L)	Multivariable β (95% CI)	P
Normoglycemia	1105	56.6±21.74	1 (Ref.)	
Prediabetes categories				
IA1c	182	54.48±23.55	1.504 (-1.642 to 4.651)	0.348
IFG	508	57.67±20.80	0.002 (-2.107 to 2.111	0.999
IGT	73	58.04±25.12	-0.056 (-4.658 to 4.546)	0.981
IFG+ IA1c	259	58.75±24.49	2.425 (-0.397 to 5.246)	0.092
IGT+ IA1c	40	45.85±15.35	-9.023 (-15.165 to -2.882)	0.004
IGT+ IFG	94	55.05±22.84	-1.866 (-6.023 to 2.292)	0.379
IA1c+ IFG+ IGT	123	54.27±28.57	0.030 (-3.799 to 3.859)	0.988

Adjusted for age, sex, body mass index, race (Hispanic, Non-Hispanic (White, Black, Asian and Other)), smoking (yes or no), drinking (yes or no), physical activity (yes or no), coronary heart disease (yes or no), calcium supplemental dose, blood collection time, diastolic blood pressure, total cholesterol, triglycerides, high-density lipoprotein cholesterol, alanine aminotransferase, calcium, phosphorus and eGFR at baseline.

PE 02-02 2. Nutrition, Education and Exercise for Obesity

A Systematic Review on the Effectiveness of Intermittent Fasting on Promoting Weight Loss and Improving Lipid Profile for Cardio Protection

Azizah Mat Hussin[1], Nur Hijrah Ramlee[1]

[1] Environmental Healthcare, Institute of Medical Science Technology - Universiti Kuala Lumpur, Malaysia

Background: Cardiovascular diseases (CVDs) are a leading cause of global morbidity and mortality, driven by various risk factors including overweight, high blood cholesterol levels, unhealthy diets, stress, diabetes, and smoking. Intermittent fasting (IF) has emerged as a promising dietary approach for mitigating these risk factors and preventing CVDs.

Methods: This systematic review of randomized clinical trials (RCTs) aimed to comprehensively assess the effectiveness of IF in promoting weight loss and improving lipid profiles for cardio protection. A rigorous search of PubMed, Scopus, ScienceDirect, Dimensions, and Google Scholar databases from 2017 to 2021 yielded 844 studies, of which 18 met the inclusion criteria. Two investigators independently screened titles and abstracts, followed by critical appraisal of full texts to determine eligibility. Included studies comprised RCTs with adult participants reporting measures of body weight, body composition, lipid profile, and blood pressure, with a BMI exceeding 24kg/m^2 and no exclusion based on health status or age.

Results: The systematic review revealed significant reductions in body weight, body fat mass, and waist circumference across various IF methods, including Alternate Day Fasting (ADF), Exercise + Alternate Day Fasting (E-ADF), Intermittent Fasting (IF), Time Restricted Eating (TRE), and consistent meal timing (CMT). Additionally, reductions were observed with Intermittent Energy Restriction (IER), Intermittent Calorie Restriction (ICR), continuous calorie restriction (CCR), and very low-calorie diet (VLCD). Notably, only one study reported no significant weight reduction post-IF intervention. Furthermore, improvements were observed in total cholesterol, triglycerides, and blood pressure levels following IF interventions.

Conclusion: These findings underscore the potential of IF as an effective intervention for weight loss, blood pressure reduction, and lipid profile improvement among overweight and obese adults, thus potentially lowering the risk of CVDs. Future research should focus on specific subgroups, including individuals with pre-existing cardiovascular conditions, to better understand the effects of IF on cardiovascular risk factors

PE 02-03 2. Nutrition, Education and Exercise for Obesity

Relationship between Somatotype Components and Body Composition Parameters as Indicators of Risk Factors for Cardiovascular Disease in College Students

Neni Trilusiana Rahmawati[1,2], Janatin Hastuti[1,2]

[1]Department of Nutrition and Health, Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada, Medika Sekip, Yogyakarta 55281, Indonesia.
[2]Lab. Bio- & Paleoanthropology, Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada, Medika Sekip, Yogyakarta 55281, Indonesia.

Background: Somatotype and body composition are considered as important health indicators for lifestyle-related diseases, including cardiovascular disease, which is caused by heart and blood vessel disorders. Somatotype is an indirect measure of body composition that provides an easy and comprehensive picture of body shape. This study aimed to examine the relationship between somatotype components and body composition parameters as risk factors for cardiovascular disease in undergraduates in Yogyakarta, Indonesia.

Methods: The research subjects were 126 undergraduates, 68 females and 58 males, aged 19 – 25 years, all subjects lived in Yogyakarta Province. Anthropometric measurements were taken including height and weight; width of humerus and femur, thickness of skin folds of triceps, biceps, subscapular, suprailiac, abdominal, thigh, and calf; as well as flexed upper arms, waist, hips, and calves. The examination includes blood pressure, body composition components (% body fat and fat-free mass), and somatotype or body type. Blood pressure was measured with a sphygmomanometer, body composition was calculated using the Slaughter formula, somatotype was determined using the Heath-Carter somatotype method, and body mass index was classified using WHO criteria for Asians. Statistical analysis used was the Pearson correlation test to determine the relationship between variables, as well as the ANOVA test to examine differences between variables based on gender.

Results: The study found that the average height and weight, body mass index, mesomorphic component, blood pressure, and body composition of male undergraduates were greater than females. There was a positive relationship between mesomorphic and endomorphic components with % body fat, whereas ectomorphic components had a negative relationship with % body fat and fat-free mass. Blood pressure correlated positively with % body fat and fat-free mass.

Conclusion: Increasing the value of somatotype components (endomorphic and mesomorphic) leads to increased body composition and blood pressure.

Keywords: somatotype, body composition, blood pressure, student,

PE 02-04 2. Nutrition, Education and Exercise for Obesity

The program of long-term therapeutic management of obese patients

Marina Berkovskaya[1], Olesya Gurova[1], Valentin Fadeev[1]

[1]I.M. Sechenov First Moscow State Medical University (Sechenov University), Moscow, Russia

Background: Despite advances in treatment of obesity, the long-term effectiveness of interventions to reduce and maintain body weight remains low. Modern medications can improve the efficacy of obesity treatment, but their long-term use is currently limited, and withdrawal leads to reverse weight gain in most patients. Bariatric surgery is the most effective tool for weight loss; however, weight regain after surgical treatment remains a relevant problem and occurs in a significant proportion of patients.

In order to improve the efficacy of obesity treatment we have developed a structured program of long-term therapeutic management of obese patients, including regular counseling on aspects of comprehensive lifestyle modification and tools to manage eating behavior.

Methods: The key components of the long-term management program are:

1.Initial data collection (initial counseling, in-person):

- Physical, laboratory, instrumental examination, analysis of current diet and lifestyle and eating behavior (by questionnaires and on the basis of food diary), finding out individual causes of weight gain (nutritional, behavioral, psychological, medical).
- Setting individual treatment goals and forming an individual strategy to achieve them, drawing up an individual counseling plan.
- Correction of comorbidities
- Prescription of pharmacotherapy to reduce body weight according to the indications

2.Follow-up long-term management (individual consultations: the first month - once every 1-2 weeks, 2-6 months - once every 2 weeks, then if necessary - once every 2-4 weeks; in-person or online):

- Food diary analysis, consistent, step-by-step implementation of healthy balanced eating habits based on the consensus reached with the patient
- Discussion and implementation of ways to reduce total caloric intake (methods of "portions", "plate", specifics of food selection and preparation methods, etc.)
- Introduction of the principles of mindful eating, hunger and satiety control, and diet planning
- Analysis of episodes of overeating, loss of control over eating behavior: finding out the causes, search and implementation of tools for their management and prevention
- Cognitive-behavioral therapy, work with the emotional sphere, management of reactions to stressful influences
- Counseling on physical activity, sleep, work and rest.

Results and Conclusion Implementation of the long-term therapeutic program has resulted in significant improvements in obesity treatment outcomes, including greater weight loss and maintaining. The program has demonstrated its effectiveness both when used alone and in combination with pharmacotherapy for weight loss, as well as in patients after surgical treatment of obesity.

PE 02-05 2. Nutrition, Education and Exercise for Obesity

To overcome the "Freshman 15" phenomenon: adolescents' perception of healthy eating in early adulthood

Euna Park[1], Jeongsoo Kim[1]

[1]Department of Nursing, Pukyong National University, Korea

Background: Like the 'freshman 15' phenomenon, American college students are said to gain up to 15 pounds (6.8 kg) in weight during their first year of college, and Australian college students are said to gain 1.9 kg during their first year of college. Adolescents in early adulthood may experience significant weight fluctuations due to various reasons. In particular, examining perceptions of healthy eating is essential for developing a healthy lifestyle and minimizing weight gain. Additionally, dietary behaviors established in early adulthood may have long-term effects on future health and occupational competency, with implications for developing a healthy and sustainable nursing workforce. Accordingly, this study applied Q methodology to confirm the degree of weight change and type of perception of healthy eating in second-year nursing students who experienced college life for one year.

Methods: Data were collected by applying 28 statements related to perception of healthy eating to 24 second-year nursing students, and processed using the PC QUANL program.

Results: Second-year nursing students lost about 0.95kg of weight compared to first-year students, which was different from previous research results. Their perception of healthy eating was divided into four types: 'seeking a balanced diet type', 'seeking variety type', 'avoiding eating out type', and 'seeking a pleasant dining atmosphere type'. 'Seeking a balanced diet type' are people who do not skip meals, overeat, or picky eaters, and pursue a diet that evenly contains the five major nutrients. 'Seeking variety type' are people who seek meals that include a variety of foods every day, such as school lunches or dormitory meals. 'Avoiding eating out type' are people who think that since delivery food and instant food are often spicy and high in calories, they can eat healthy just by reducing them. 'Seeking a pleasant dining atmosphere type' are people who believe that while it is important to improve the quality of meals through nutritious food, the healthiest meal is to eat while having fun communicating with family with the idea of a small society at the table.

Conclusion: Second-year nursing students know what a healthy eating is, but it is not easy to actually choose a healthy eating due to fatigue or lack of time due to various evaluations and tests. In particular, when living alone or in a dormitory, it is difficult to eat vegetables and fruits, and fast food and carbonated drinks are easily accessible. Therefore, it is thought that time management and priority decision-making training for choosing healthy meals will be necessary depending on the type of nursing students' perception of healthy eating.

Keywords: Nursing students, Healthy eating, Perception, Q-methodology

PE 02-06 2. Nutrition, Education and Exercise for Obesity

The Effect of Oral α-cyclodextrin on Glycemic Control and Body Weight in Obese Patients with Type 2 Diabetes: Case Series

Ardian S Pramesti[1], Sarah NP Erawan[1]

[1]Clinical Nutrition Department, Relieve Clinic, Indonesia

Background: α-cyclodextrin (α-CD) is a soluble dietary fiber derived from corn. In the initial studies conducted on healthy overweight and/or obese diabetic subjects, it was found that the consumption of α-CD was associated with weight loss or maintenance, as well as lower triglyceride (TG) and cholesterol levels in hyperlipidemic subjects. Furthermore, researchers found that α-CD may inhibit carbohydrate digestion, which could potentially lower postprandial glycemic responses to carbohydrate-containing diets. Thus, α-CD consumption was associated with increased insulin and leptin sensitivity. The purpose of this report is to determine whether consuming α-cyclodextrin affects glycemic control and body weight in obese patients with type 2 diabetes.

Methods: This was a single-center case series that included adults with new-onset type 2 diabetes, with or without antidiabetic medications, who presented to our facility from June to December 2023 with a body mass index above 24.9 kg/m2. Pregnant patients were excluded. We collected data from the electronic medical records. We diagnosed diabetes in these patients based on a hemoglobin A1C (HbA1C) level over 6.5%. Every participant had received 6 grams of α-CD daily via oral for 12–14 weeks, combined with a balanced diet of 20–21 kcal/kg bw/day.

Results: Three participants, one man and two women, met our diagnostic criteria. α-CD was well-tolerated, and no significant adverse effects were observed. One participant reported minimal gastrointestinal symptoms. All participants' body weight decreased. In addition, fasting plasma glucose and HbA1C levels decreased.

Conclusion: Treatment with α-CD appears to be safe and well-tolerated. A treatment intervention promoting a balanced diet and α-CD as part of routine care can successfully reduce body weight and improve glycemic control.

PE 02-07 2. Nutrition, Education and Exercise for Obesity

Impact of Muscle Strength on Self-rated Health and Life Satisfaction in the Elderly: Findings from the Korean Longitudinal Study of Aging (2006-2018)

Yoo-Bin Seo

Department of Family Medicine, Wonkwang University Sanbon Hospital, Wonkwang University College of Medicine, Gunpo, Korea

Introduction: With the increasing aging population and life expectancy, it has become crucial for the elderly to maintain both physical and mental well-being throughout their lives. Sarcopenia, defined as a gradual decline in muscle mass and strength due to aging, is considered a significant health issue in elderly populations. Hand Grip Strength (HGS) is widely employed in diagnostic algorithms for sarcopenia, and reduced HGS has been identified as a predictor of dysfunction, comorbidities, mortality, and mental health, as well as quality of life. This study aims to investigate whether changes in muscle strength, as measured by hand grip strength, affect self-rated health and life satisfaction.

Methods: The data for this study were derived from the 1st (2006) and 7th (2018) waves of the Korean Longitudinal Study of Aging (KLoSA). KLoSA is a nationwide, longitudinal study aimed at providing essential data for the implementation of health and social policies regarding the rapidly aging population. In this study, 1178 participants aged 65 or older from KLoSA were categorized into four groups based on the change in hand grip strength from 2006 to 2018 (normal normal, normal -> low, low -> normal, low -> low). The relationships between these groups and self-rated health and life satisfaction were evaluated. Low hand grip strength was defined as handgrip strength <28 kg for men and <18 kg for women.

Results: Compared to the 'low -> low' group, the odds ratio for positive self-rated health was 1.71 (95% confidence interval [CI], 1.20-2.44) in the normal ->normal group, and 1.82 (95% CI, 1.17-2.83) in the low->normal group. The odds ratio for high life satisfaction was 1.33 (95% CI, 0.94-1.89) in the normal->normal group and 1.46 (95% CI, 0.94-2.28) in the low->normal group.

Conclusion: The maintenance or improvement of muscle function is potentially associated with positive self-rated health and high life satisfaction.

Keywords: sarcopenia; hand-grip strength; self-rated health; life satisfaction

PE 02-08 2. Nutrition, Education and Exercise for Obesity

Fruits and Vegetables Consumptions Among Working Adults in Kuala Lumpur and Selangor, Malaysia

Thipashri Muthamil Selavan[1], Sarina Sariman[1] and Sairah Abdul Karim[2]

[1]*Department of Healthcare Professional, Faculty of Health and Life Sciences, Management and Science University, Selangor, Malaysia*
[2]*Department of Diagnostic and Allied Health Science, Faculty of Health and Life Sciences, Management and Science University, Selangor, Malaysia*

Background: Increased fruits and vegetables consumption have been linked to a lower risk of chronic diseases and healthier weight management. The 2019 National Health and Morbidity Survey of Malaysia reported that 95% of Malaysian aged 18 and above consumed less than five servings of fruits and vegetables each day. Malaysians eat an average of 1.4 servings of fruits and 1.51 servings of vegetables per day.

Methods: This cross-sectional study involved 242 working adults aged 18 to 60 years recruited through purposive sampling technique. Self-administered questionnaires comprised of socioeconomic and demographic data and a semi - quantitative Food Frequency Questionnaire adapted from The Malaysian Adult Nutrition Survey was used to obtain individuals' daily fruit and vegetable intake.

Results: Majority of the respondents in study were female (51.7%), from Malay ethnic group (60.7%) with mean age of 33.7+11.3 years. Most respondents had bachelor's degree academic qualification (48.3%) with total household income of less than USD1100. Approximately 97.1% of respondents eat one serving of fruits and vegetables per day, falling short of the recommended daily fruit and vegetable intake of Malaysia. Daily consumption of fruits and vegetables did not significantly correlate with age ($\chi 2 = 1.423$, $p>0.05$). No significant difference was also observed in daily fruit and vegetable intake across genders ($\chi 2 = 0.223$, $p>0.05$).

Conclusion: In this study, working adults with lower levels of education, age, and singleness consumed substantially fewer fruits and vegetables than the suggested daily intake of the Malaysian Dietary Guidelines. Despite the substantial health benefits of fruits and vegetables, the respondents' intake still below the recommended levels. As a result, increasing intakes should continue to be a focus of public health activities aimed at alleviating the global burden of chronic illnesses related to diet and nutrition.

Keywords: Fruits and vegetables, working adults, obesity

PE 02-09 2. Nutrition, Education and Exercise for Obesity

Protective effects of blackcurrant extract on muscle atrophy induced by palmitic acid via the AMPK/SIRT1/PGC-1α signaling pathway

You Ree Nam, Ji Min Kim, Ye Ji Kim, and Kyung Ah Kim

Food & Nutrition, Chungnam National University, Daejeon 34134, Korea

Background: Obesity is a chronic and multifaceted disease caused by excessive accumulation of fat. This condition is associated with loss and dysfunction of skeletal muscle and muscle atrophy. Polyphenols, which are antioxidants and anti-inflammatory agents derived from plants, are beneficial in preserving muscle mass in various muscle-related diseases. This ingredient mainly improves mitochondrial function and promotes mitochondrial production to prevent muscle atrophy. In this study, we examined the effect of anthocyanin-rich blackcurrant extract (BCE) on palmitate-induced muscle atrophy in C2C12 cells.

Methods: C2C12 myotubes were treated with palmitic acid (750μM) to induce muscle atrophy, followed by treatment with blackcurrant extract (BCE). The protective effects of BCE against muscle atrophy were assessed by measuring the mRNA and protein levels of muscle atrophy markers, including muscle ring-finger protein 1 (MuRF-1) and ubiquitin E3-ligase muscle-specific F-box protein (MAFbx/Atrogin-1). additionally, the regulation of mitochondrial function and related signaling pathways were assessed by measuring the protein expressions of Mitochondrial Transcription Factor A (mtTFA), Estrogen-Related Receptor Alpha (ERRα), AMPK, Sirt-1, and PGC-1α using western blot analysis.

Results: BCE improved the mRNA and protein expressions of MuRF-1 and MAFbx/Atrogin-1, indicators of muscle atrophy, which were elevated due to treatment with palmitic acid. mtTFA is a key regulator that binds to mitochondrial DNA to promote its replication and transcription, and ERRα regulates various metabolic pathways that enhance mitochondrial biogenesis. BCE increased the activity of these two regulators. Importantly, ERRα is known to interact with PGC-1α to enhance mitochondrial biogenesis and function. To investigate whether BCE was involved in the crucial AMPK/Sirt-1/PGC-1α signaling pathway that regulates muscle metabolism and energy production, the protein expressions of each factor were analyzed. The results showed that BCE improved the protein expression levels of AMPK, Sirt-1, and PGC-1α, which had been reduced by palmitate treatment.

Conclusion: Mitochondria are essential in skeletal muscle for maintaining cellular homeostasis and health, and their dysfunction can cause muscle atrophy. AMPK/Sirt1/PGC-1α pathway regulates mitochondrial biogenesis and energy metabolism. This study suggests that BCE inhibits palmitate-induced muscle atrophy by activating AMPK/Sirt1/PGC-1α signaling.

PE 02-10 2. Nutrition, Education and Exercise for Obesity

Effects of blackcurrant extracts on H_2O_2-induced muscle atrophy in C2C12 cells

Kyungah Kim, Jimin Kim, Yeji Kim, and Youree Nam

Food & Nutrition, Chungnam National University, Daejeon

Background: Blackcurrants have been reported to have anti-inflammatory and antioxidant effects on oxidative stress and DNA damage. Several studies have reported that oxidative stress causes muscle atrophy through the production of reactive oxygen species. Therefore, the aim of this study was to evaluate the effects of blackcurrant extract on H_2O_2-induced muscle atrophy in C2C12 cells.

Methods: To examine the cytotoxic effects of the blackcurrant extract (BCE) on C2C12 cells, cell viability was measured using the WST assay. C2C12 myotubes were incubated without or with BCE at various concentrations (25-400 μg/ml). The effects of BCE were determined in H_2O_2-induced C2C12 myotubes. Muscle atrophy was assessed by evaluating the mRNA expression levels of Atrogin-1 using RT-qPCR. Additionally, the protein expression levels of muscle ring finger protein-1 (MuRF-1), Atrogin-1, sirtuin-1 (Sirt1), AMP-activated protein kinase (AMPK), and phospho-AMPK were analyzed by Western blot.

Results: MuRF-1 and Atrogin-1 are recognized as significant markers of muscle atrophy. RT-qPCR analysis showed increased mRNA expression of Atrogin-1 in H_2O_2-induced C2C12 myotubes. Western blot analysis further confirmed the increased protein levels of MuRF-1 and Atrogin-1 in H_2O_2-induced C2C12 myotubes. In contrast, BCE treatment resulted in decreased Atrogin-1 mRNA expression and protein expression of MuRF-1 and Atrogin-1 in H_2O_2-induced C2C12 myotubes. Furthermore, H_2O_2 treatment exhibited decreased protein levels of Sirt1 and activation of AMPK. AMPK and Sirt1 are identified as significant markers for mitochondrial biogenesis. BCE treatment increased the protein expression of Sirt1 and the activation of AMPK.

Conclusion: These results demonstrate that BCE could protect H_2O_2-induced muscle atrophy by activating the AMPK/Sirt1 signaling pathway.

PE 02-11 2. Nutrition, Education and Exercise for Obesity

Effects of an Aquatic Exercise Program on Muscle Function, Balance, and Quality of Life in Overweight/Obese Women with Knee Osteoarthritis

Yoonjung Choi[1], Junghoon Kim[1]

[1]Department of Sports Medicine, Graduated School of Sports Convergence, National Korea Maritime and Ocean University, Busan, Republic of Korea

Background: Overweight and obesity increase the risk of knee osteoarthritis (KOA) due to the mechanical load placed on weight-bearing joints, resulting in pain and functional limitations that make activities difficult. This can lead to weakness in the knee muscles, which can reduce physical function and impair daily activities. Exercise interventions are essential for people with knee osteoarthritis, but implementing these interventions can be difficult due to the potential risk of pain and injury. Aquatic exercise programs offer benefits to patients with knee osteoarthritis (OA) and can be an effective treatment option for this pathological condition.

Methods: In this study, 30 elderly women diagnosed with knee osteoarthritis were randomly assigned to either a no-exercise control group (CG=15) or an aquatic exercise group (AG=15). Aquatic exercise program was performed three times per week for eight weeks in a pool. Muscle function was evaluated by measuring peak torque of the knee muscles using an isokinetic dynamometer (Biodex Medical Systems, Shirley, NY, USA). Static balance was assessed through the Single Leg Stance Test (SLS), and knee pain intensity was quantified using a visual analog scale (VAS). Furthermore, health-related quality of life (HRQOL) was determined utilizing the validated Korean version of the EQ-5D-5L.

Results: The AG group significantly improved knee muscle function over time, with increases in extension of 60°/s ($p < .001$) and 180°/s ($p < .05$) and flexion of 60°/s ($p < .01$). Balance measures also showed a significant improvement in the AG group ($p < .01$), while the CG group showed a significant decrease ($p < .01$). Knee pain (VAS) and quality of life (EQ-5D) also showed significant improvement in the AG group, while there was no significant change in the CG group.

Conclusion: These findings suggest that water exercise improves muscular function, balance, and knee pain in overweight/obese women with osteoarthritis and contributes to their HRQOL.

Keywords: knee osteoarthritis, aquatic exercise, muscle function, balance, quality of life

PE 02-12 2. Nutrition, Education and Exercise for Obesity

Development and Pilot Testing of a Telenutrition Course for Improving Competency in Virtual Nutrition Care

Kendall Hess[1], Melissa Ventura-Marra[1]

[1]Department of Animal and Nutritional Sciences, West Virginia University, USA

Background: Telenutrition enhances access to nutrition care and improves health outcomes.[1,2] Educational programs for health professionals now emphasize the necessity of including competency-based telehealth training in the curriculum, but many nutrition programs in the U.S. have yet to integrate it. This research aims to develop and pilot-test a competency-based telenutrition course for preparing nutrition students for entry-level practice.

Methods: A backward course design and Miller's framework for competency-based education (CBE)[3,4] were employed to create the course. Module topics included virtual care basics, goal setting, motivational interviewing, coaching techniques, and behavior change theories. Assessment areas included student knowledge (knows), competence (knows how), performance (shows how), and action abilities (does). An initial cohort of students (n=5) was recruited to pilot-test the course using summative and formative assessment methods.

Results: The class consisted of nine online modules (knows), three in-class scripted role-modeling activities (knows how) and in-person demonstrations (shows), and one simulated telehealth coaching session (does). Assessments included quizzes, active peer and instructor feedback, and student self-reflection. Data indicated that 100% of students strongly agreed or agreed that role-playing, practice sessions, and reflections were essential to improving their knowledge and confidence and preparing them for real-life virtual encounters. All students perceived increased confidence in their telehealth abilities and demonstrated entry-level competence, thereby showing the practical effectiveness of the CBE curriculum in this cohort. Qualitative feedback from students will be used to enhance the course content, and enrollment will be expanded for further testing.

Conclusion: Telenutrition education is essential to equipping entry-level professionals with the skills and confidence to deliver safe and effective telehealth services to improve patient outcomes. Including competency-based telenutrition training in educational programs is necessary to prepare the dietetics workforce for the expanding mode of virtual care delivery and to keep pace with other health professional training.

PE 02-13 2. Nutrition, Education and Exercise for Obesity

Adequate Protein Intake in Combination with Exercise Increased Muscle Mass and Muscle Strength in Cancer Patients with Sarcopenic Obesity: A Case Report

Firisha Virgidewi Witjaksono[1], Diana Sunardi[1], Nurul Ratna Mutu Manikam[1]

[1]Departmet of Nutrition, Faculty of Medicine, University of Indonesia – Dr. Cipto Mangunkusumo General Hospital, Jakarta, Indonesia

Background: Sarcopenic obesity, characterized by a loss of muscle mass and an increase in fat mass, is associated with poor prognosis, prolonged hospitalization, and increased mortality, particularly in cancer patients. Effective management strategies include adequate protein intake, resistance training, and aerobic exercise. Physical activity can enhance insulin sensitivity, reduce oxidative stress and inflammation, and promote muscle mass gains in cancer patients with sarcopenic obesity.

Case Presentation: A 62-year-old woman with breast cancer presented with sarcopenic obesity (reduced muscle mass, high body fat). To counteract this, an adequate protein intake (1.2 g/kg body weight) and a daily regimen of morning walks with light barbell weightlifting (0.5–1 kg) for 30 minutes were prescribed. This case exemplifies the potential of a multi-modal approach for managing sarcopenic obesity in oncology, potentially promoting functional capacity and treatment efficacy.

Results: Resistance training and aerobic exercise were implemented to enhance muscle mass, anaerobic endurance, and skeletal muscle size. Dietary intake was closely monitored, ensuring adequate protein consumption (1.2 g/kg body weight) as recommended. Resistance training and aerobic exercise education were also provided. On the 4th visit, bioelectrical impedance analysis (BIA) revealed a significant increase in muscle mass and a decrease in body fat percentage. Initially, muscle mass was 17.8% and body fat percentage was 36%. After exercising 3 to 5 times a week for 30 minutes in a month, muscle mass increased to 24%, and body fat percentage decreased to 30%. Additionally, handgrip strength improved, with initial values of 19 kg for the right hand and 10 kg for the left hand increasing to 25 kg and 15 kg, respectively.

Conclusion: An adequate intake of protein, complemented by resistance training and aerobic exercise, can effectively ameliorate the condition of sarcopenic obesity in cancer patients. This strategy also improving the quality of life.

Keywords: Resistance training, aerobic, protein intake, cancer, sarcopenic obesity

PE 02-14 2. Nutrition, Education and Exercise for Obesity

The Food Insecurity-Adiposity Paradox: A Comparison of Different Adiposity Measures

Sukyoung Jung[1], Sohyun Park2,3

[1]Department of Health Care Policy Research, Korea Institute for Health and Social Affairs, Republic of Korea
[2]Department of Food Science and Nutrition, Hallym University, Republic of Korea
[3]The Korean Institute of Nutrition, Hallym University, Republic of Korea

Background: Extensive research has indicated the paradox of food insecurity and obesity; however, most studies used anthropometric measures like body mass index (BMI) or waist circumference (WC), which may not accurately assess adiposity, especially in Koreans. This study examined the association between food insecurity and obesity risk by comparing three adiposity indicators: estimated percent body fat, BMI, and WC.

Methods: This study used data from the Korea National Health and Nutrition Examination Survey 2019–2021 (n=14,135 aged 19 years and older). Food insecurity was assessed using an 18-item modified version of the US Household Food Security/Hunger Survey Module, with scores of 3-18 indicating food insecurity. Three different obesity measures were defined: body fat percentage (estimated from the prediction equation) of 25% for men or 35% for women, BMI of 25 kg/m2, and WC of 90 cm for men or 85 cm for women. Logistic regression models were used to estimate odds ratios (OR) with 95% CIs after adjusting for confounders.

Results: From 2019 to 2021, 4% of households experienced food insecurity. Food insecurity was positively associated with body fat percentage-defined obesity (OR, 1.29; 95% CI, 1.02-1.63), while negatively associated with BMI-defined obesity (OR, 0.77; 95% CI, 0.62-0.96) and not associated with WC-defined obesity (OR, 1.17; 95% CI, 0.93-1.47). When stratified by residential area (P interaction=0.045), a positive association between food insecurity and body fat percentage-defined obesity was observed in urban residents (OR, 1.43; 95% CI, 1.11-1.86), but not in rural residents (OR, 0.84; 95% CI, 0.51-1.39).

Conclusion: Food insecurity was linked to obesity, as defined by a higher body fat percentage, among Korean adults aged 19 years and older, particularly those living in urban areas. Food insecurity might demonstrate a stronger association with body fat percentage than with BMI or WC.

PE 02-15 2. Nutrition, Education and Exercise for Obesity

Effect of Fermented Growth Oyster (FGO) extract on Bone Health in Postmenopausal Women: A Multicenter, randomized, double-blind, placebo-controlled trial

Seongho Han[1], Bokyung Shine[1], Kyongmin Rheu[2]

[1]Department of Family Medicine, Dong- A University Hospital, South Korea
[2]Marine Bioprocess Co, Ltd, South Korea

Background: Fermented growth oyster (FGO) extract has been proven beneficial to bone health by inhibiting osteoclastogenesis while promoting osteoblastogenesis. However, no known clinical investigation has been conducted on its effect on bone metabolism.

Methods: A multicenter randomized, double-blind, placebo-controlled clinical trial for 24 weeks aims to evaluate the efficacy of FGO on bone health in postmenopausal women. One hundred twenty participants were randomly divided into the experiment group (EG) and control group (CG). Osteocalcin (OC), urine deoxypyridinoline (DPD), C-telopeptide of type-1 collagen (CTX), and N-telopeptide of type -1 collagen (NTX), bone-specific alkaline phosphate (BALP), DPD/OC ratio, calcium (Ca), bone mass density (BMD), estrogen and growth hormone (GH), the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score and Kupperman index were assessed at baseline and the end of the trial

Results: The OC($p<0.001$) and BALP ($p=0.02$) levels were significantly increased in EG, while the DPD/OC ratio ($p=0.024$) significantly decreased, representing an increase in bone formation and a lowering of bone turnover rate. There were no significant differences in the case of DPD, Ca, CTX, NTX, BMD, estrogen, WOMAC score, and Kupperman index.

Conclusion: In conclusion, intake of FGO over 24 weeks improved bone health in postmenopausal women by promoting bone formation and lowering the bone turnover rate

PE 02-16 2. Nutrition, Education and Exercise for Obesity

Impact of personalized small frequent meal pattern diet, Pranayama, Cardio exercises on Body weight, insulin resistance, and other clinical parameters: Endocrinologist experience from South India.

Santosh Ramakrishnan[1], Prudwiraj Sanamandra[1], Monika SJ[2]

[1]Department of Endocrinology, Magna Center for obesity, diabetes and endocrinology, Hyderabad, India
[2]Department of Dietetics and Nutrition, Military hospital, Deolali, Nashik, India

Background: The international guidelines for Polycystic Ovary Syndrome (PCOS) advocate for a patient-centered approach rather than a conventional treatment protocol. The objective of our study is to comprehend the primary health concerns of PCOS patients and assess the changes in various clinical parameters following a personalized treatment for a duration of 6 months.

Methods: We conducted a retrospective analysis of the case-records of PCOS patients enrolled into the PCOS clinic. The PCOS clinic consists of a dietician (personalised small frequent high fibre diet with weekly review), an exercise counsellor (monthly review, stress on cardio exercises 3 hours a week), a psychologist (review as per need, stress on pranayama for 15 mins a day) and an endocrinologist (2 months review). We compared the participants HOMA-IR, BMI, Waist circumference, main PCOS related concern at baseline and after 6 months of treatment. Appropriate statistical analysis was done.

Results: Overall, 91 case-records were available for analysis. The mean age of patients was 28 years. Changes in clinical parameters are mentioned in table 1 and PCOS concerns are mentioned in Table 2

Conclusion: Tailored pharmacological interventions and lifestyle modifications reduced insulin resistance, mitigated psychosocial stressors, and improved quality of life in women with polycystic ovary syndrome (PCOS).

Table 1: Changes in Clinical Parameters of PCOS

Clinical Parameters, Unit Number of patients (N)	Baseline Mean (SD)	6-months Mean (SD)	Difference Mean 95% CI)	P-value
Body-mass index, kg/m2 (N = 90)	27.7 (3.6)	26.3 (3.1)	-1.49 (-1.85, -1.13)	<0.05
Waist circumference, cm (N = 68)	91.5 (7.7)	89.5 (7.2)	-3.12 (-3.64, -2.59)	<0.05
HOMA IR (N = 69)	3.4 (0.9)	2.9 (0.7)	-0.60 (-0.73, -0.47)	<0.05
Body-fat, % (N = 74)	30.5 (5.8)	28.8 (4.6)	-1.77 (-2.17, -1.37)	<0.05

SD: standard deviation

Table 2: Patients with Clinical Manifestations of PCOS

Clinical Manifestations	Baseline, N (%)	6-months, N (%)	P-value
Menstrual Abnormalities	63 (69.2%)	21 (23.1%)	<0.05
Hirsutism	47 (51.6%)	10 (11%)	<0.05
Acne	25 (27.5%)	2 (2.2%)	<0.05
Fertility Concern	19 (20.9%)	4 (4.4%)	<0.05
Acanthosis Nigricans	75 (82.4%)	68 (74.7%)	0.21
Skin Tags	22 (24.4)	19 (20.9)	0.57

PE 02-17 2. Nutrition, Education and Exercise for Obesity

Effect of combined diet and exercise interventions on visceral and subcutaneous fat in an obese woman with cervical cancer: A Case Report

Yohana E. Gultom[1], Yohannessa Wulandari[1], Nurul Ratna Mutu Manikam[1]

[1]Departement of Nutrition, Faculty of Medicine, University of Indonesia – Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Background: Obesity is a pathological increased fat mass, which is associated with an increased health risk, including cervical cancer.[1,2] Low visceral and low fat mass body composition has a favorable overall survival among patients with cervical cancer.[3] Adipose tissue expansion and dysfunction increase inflammation, reactive oxygen species (ROS) production, mitochondrial dysfunction, and insulin production. Exercise can improve mitochondrial function, promote antioxidant system, and glucose transportation. There was a significant effect of nutrition and exercise interventions on body weight, fat, and lean mass in adults diagnosed with cancer.[4]

Methods: A 54-year-old obese woman with cervical cancer receiving chemoradiotherapy has high visceral and subcutaneous fat. A combine intervention on life style modification of 1500 kcal/d diet with 50-60% carbohydrate, 15-20% protein, and 25-30% fat, aerobic exercise and resistance training were prescribed. This case demonstrates the importance of multidisciplinary and multimodal treatment in managing obesity in oncology.

Results: The nutrition intervention was performed in 3 visits. She followed 1500 kcal/day diet consisting of 50-60% carbohydrate, 15-20% protein, and 25-30% fat. The aerobic exercise was ≥ 150 mins of moderate intensity and resistance training ≥3 times/week. In addition, the patient was instructed to consume n-3 fatty acids. Body composition was assessed using a bioelectrical impedance analysis (BIA). Weight loss was 0,9 kg (1.3%) in 13 days and 1.3 kg (2.9%) in 26 days. Furthermore, visceral fat was reduced from 10 to 9.5 and subcutaneous fat was reduced from 33.5% to 33.0%. The handgrip was significantly higher from 20.8 to 22.7 kg on right hand and 16.8 kg to 18.0 kg on left hand.

Conclusion: A combined diet and exercise interventions have successfully reduced body weight, visceral, and subcutaneous fat in obesity with cancer.

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PE 02-18 2. Nutrition, Education and Exercise for Obesity

Age-specific association of physical activity on visceral obesity by CT scan

Yoon Jeong Cho, Hana Moon

Department of family medicine, Daegu Catholic University School of Medicine, Korea

Background: Obesity is a chronic disease that needs to be managed worldwide. High-intensity physical activity has a positive effect on the improvement and prevention of metabolic diseases. The purpose of this study was to investigate the age-specific association of physical activity on abdominal and visceral obesity.

Methods: The study involved 456 health check-up participants who underwent abdominal computed tomography scans for the assessment of visceral fat area from January 2017 to December
2017. Physical activity levels were categorized as none-to-low-intensity or moderate to vigorous-intensity based on the International Physical Activity Questionnaire. Logistic regression analysis, adjusted for covariates, assessed the association of physical activity with abdominal and visceral obesity across 10-year age intervals

Results: The moderate-to-vigorous physical activity group showed 56.5% visceral obesity, while the none-to-low-intensity physical activity group had 63.2%. . Covariates included sex, BMI, marital status, smoking, alcohol consumption, past medical history (hypertension, diabetes mellitus, dyslipidemia, cerebrovascular disease, cardiovascular disease, liver disease, osteoporosis), and any cancers . After adjusting for these covariates, no significant differences in abdominal obesity were observed across all age group. Most age groups exhibited no significant differences in abdominal or visceral obesity according to physical activity. However, the 50 to 59 age group demonstrated a noteworthy association between visceral obesity and none-to-low-intensity physical activity (odds ratio 3.79, 95% confidence interval 1.12–12.84).

Conclusion: This study highlights a distinct age-related response to physical activity, emphasizing the 50 to 59 age group's significant association between visceral obesity and none-to-low intensity physical activity.

PE 02-19 2. Nutrition, Education and Exercise for Obesity

Consumer Preferences for Food Retailers and Purchasing Patterns in Urban Poor Areas of Kuala Lumpur, Malaysia

Anis Munirah MS[1], Sameeha MJ[1], Che Aniza CW[2], Cheah YK[3], You HW[4], Adila FS[5], Borazon EQ[6], Phulkerd S[7], Poh BK[1] on behalf of the SEAOFE Study Group

[1]*Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia, 50300 Kuala Lumpur, Malaysia*
[2]*Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600 Bangi, Malaysia*
[3]*School of Economics, Finance and Banking, Universiti Utara Malaysia, Sintok 06010, Kedah, Malaysia*
[4]*Pusat PERMATA@Pintar Negara, Universiti Kebangsaan Malaysia, 43600 Bangi, Malaysia*
[5]*Reconstra Utama Integra, 12150 Jakarta*
[6]*International Graduate Program of Education and Human Development (IGPEHD), College of Social Sciences, National Sun Yat-Sen University, 80424 Kaohsiung City, Taiwan*
[7]*Institute for Population and Social Research, Mahidol University, 73170 Nakhon Pathom, Thailand*

Background: The rising rates of overweight and obesity (O/O) are a significant concern, especially in urban poor areas. However, factors associated with food retail have rarely been studied. Hence, this study aimed to examine consumer preferences for food retailers and purchasing patterns among urban poor in Kuala Lumpur, so that factors contributing to O/O can be better understood.

Methods This cross-sectional study is part of the South East Asian Obesogenic Food Environment (SEAOFE) study. Consumer intercept survey was conducted at hypermarkets, supermarkets, convenience stores, and traditional stores at selected urban poor areas in Kuala Lumpur. Sociodemographic information, including gender, age, self-reported weight and height, and food retail-related data from adults aged 18 years and above were collected. Body mass index (BMI) was classified based on WHO 1998 guidelines.

Results: A total of 1004 consumers (35.5% males; 64.5% females) who were predominantly aged 18-40 years (68%) participated. Mean weight, height, and BMI were 64.9±15.4 kg, 160.7±11.5 cm, and 24.9±5.5 kg/m^2, respectively, with nearly half categorized as O/O (42.0%). Significant association was found between consumer's preferences for food retailers and their BMI ($p<0.001$). Supermarkets were the preferred shopping venues for nearly half of the consumers (45.6%), including those in the O/O categories, while traditional stores were the least preferred (8.2%). At supermarkets, the most purchased food products were fresh foods (52.3%), followed by processed foods (29.7%) and beverages (18.0%).

Conclusion: The study revealed an association between consumer preferences for food retailers and BMI of urban poor population. While fresh foods were the most commonly purchased items at supermarkets, there were also significant purchases of processed foods and beverages. Future research should explore healthy food availability at retailers and actual consumption patterns to promote better purchasing decisions and healthier behaviors, ultimately reducing O/O rates in urban poor areas.

PE 02-20 2. Nutrition, Education and Exercise for Obesity

Relationships between Cardiorespiratory Fitness, Leisure-Time Physical Activity and Heart Rate Recovery in Women with Overweight and Obesity

Serim Cho, MSc, Minsub Han, MSc, JeongEun Yun, MSc, Seongmin Kim, MSc, SoJung Lee, PhD.

Division of Sports Medicine and Science, Graduate School of Physical Education, Kyung Hee University, Yongin, Republic of Korea

Background: A delayed heart rate recovery (HRR) immediately after exercise is a marker of impaired parasympathetic reactivity and an independent predictor of all-cause and cardiovascular disease (CVD)-related mortality in men. We examined the associations between cardiorespiratory fitness, leisure-time physical activity and HRR in women with overweight and obesity.

Methods: Forty-nine physically inactive premenopausal women with overweight and obesity (age: 28.3 ± 7.0 years, BMI: 25.5 ± 1.9 kg/m^2) participated in the study. Cardiorespiratory fitness was measured by maximum oxygen consumption during a graded treadmill test using indirect calorimetry. HRR was calculated as the difference between peak heart rate (HR) and HR at 1, 2, 3 and 5 minutes after cessation of the maximal treadmill test. Leisure-time physical activity was assessed by the International Physical Activity Questionnaire, and body composition was measured by bioelectrical impedance analysis.

Results: Cardiorespiratory fitness was significantly associated with absolute HRR at 1 (r=0.347), 2 (r=0.639), 3 (r=0.664) and 5 (r=0.650) minutes after cessation of the maximal treadmill test, and these observations remained significant after controlling for BMI or waist circumference. High levels of vigorous-intensity physical activity is associated with absolute HRR at 2 (r=0.347), 3 (r=0.356) and 5 (r=0.332) minutes, and these remained significant after further adjusting for BMI or waist circumference.

Conclusion: HRR is a marker of cardiorespiratory fitness and vigorous-intensity physical activity levels independent of BMI and abdominal obesity in women with overweight and obesity.

PE 02-21 2. Nutrition, Education and Exercise for Obesity

Comparison of Dynamic Balance Ability According to Body Fat Percentage in Female College Students

Sang-Jun Cho[1], Jeong-Ro Lee[1], Ryu-Ri Song[1], Gwang-Yeol Baek[1], Ye-Ji Kim[1], Yun-A Shin[1]

[1]Department of Prescription and Rehabilitation of Exercise, Dankook University, Republic of Korea

Background: Obesity is a major risk factor for various chronic diseases and musculoskeletal disorders. Female students with higher body fat percentages are likely to experience limitations in functional movement, which can exacerbate musculoskeletal issues. This study aims to examine the differences in functional movement based on body fat percentage among female college students.

Methods Thirty-four female college students were measured body composition, functional movement screening (FMS), and lower quarter Y-balance test (LQ-YBT). An independent samples t-test was conducted to compare FMS & LQ-YBT scores between the groups. All statistical analyses were performed using SPSS 29.0, with a significance level set at p<.05.

Results: The BMI of female college students (20.06±1.41 years) was within the normal range (20.98±2.50 kg/m^2), but their body fat percentage (%BF) was high (30.14±4.71%). In the FMS, hurdle step-right (t=2.1909, df=32, p=0.0359), inline lunge-left (t=2.5584, df=32, p=0.0155), and Right (t=2.3635, df=32, p=0.0243) showed statistically significant differences between the groups. In the LQ-YBT, left anterior reach (t=2.7854, df=32, p=0.0089) showed a statistically significant difference between the groups.

Conclusion: The study found significantly differences between the groups in FMS, including hurdle step-right, inline lunge-left and right. Additionally, a significant difference was observed in the LQ-YBT for left anterior reach. These results suggest that body fat percentage may impact functional movement in female college students.

PE 02-22 2. Nutrition, Education and Exercise for Obesity

Obesity's Effects on Upper and Lower Limb Stability: An Analysis of Female College Students

Jung-Ro Lee[1], Ryu-Ri Song[1], Gwang-Yeol Baek[1], Sang-Jun Cho[1], Ye-Ji Lee[1], Yun-A Shin[1]

[1]Department of Prescription and Rehabilitation of Exercise, Dankook University, Republic of Korea

Background: Obesity is a serious health issue with increasing prevalence worldwide. Despite advancements in understanding its multifactorial nature, there's limited information on the structural and functional limitations caused by obesity. This study investigates the impact of obesity levels on functional movement.

Methods: Thirty-four female college students underwent body composition analysis, Functional Movement Screening, and Upper and Lower Quarter Y-Balance Tests. Pearson correlation and simple linear regression analyses were used to examine relationships and impacts of body fat percentage (%BF) on these tests.

Results: The BMI of female college students (20.06±1.41 years) was within the normal range (20.98±2.50 kg/m^2), but their body fat percentage (%BF) was high (30.14±4.71%). Analysis of the correlation between %BF and UQ-YBT revealed significant negative correlations with Right Inferior Lateral reach (UQYBT-Rt-IL) and Right Composite Score (UQYBT-CS) (r=-0.363, -0.345, p<.05). A significant negative correlation was also found between %BF and LQ-YBT with left anterior reach (LQYBT-Lt-AR) (r=-0.468, p<.01). Regression analysis showed that %BF had impacts of 13.2%, 11.9%, and 21.9% on UQYBT-Rt-IL, UQYBT-Rt-CS, and LQYBT-Lt-AR, respectively, with each 1% increase in %BF resulting in decreases of 0.116%, 0.161%, and 0.643% in function. Analysis of the correlation between %BF and FMS revealed significant negative relationships with Left-Inline Lunge (FMS-Lt-IL), Right-Inline Lunge (FMS-Rt-IL), and Trunk Stability Push Up (FMS-TSP) (r=-0.372, -0.353, -0.349, p<.05). Regression analysis showed that %BF had impacts of 13.8%, 12.5%, and 12.2% on FMS-Lt-IL, FMS-Rt-IL, and FMS-TSP, respectively, with each 1% increase in %BF resulting in decreases of 0.052 points for FMS-Lt-IL and FMS-Rt-IL, and 0.042 points for FMS-TSP.

Conclusion: Increased body fat percentage in female college students reduces dynamic stability and core stability during functional movements. Exercise guidance to enhance core stability is necessary to mitigate these effects.

PE 02-23 2. Nutrition, Education and Exercise for Obesity

The Effects of Different Breathing Techniques on Lower Extremity Muscular Function and Balance Ability in Overweight Males

Gwang-Yeol Baek[1], Ye-Ji Kim[1], Sang-Jun Cho[1], Ryu-Ri Song[2], , Jeong-No Lee[2], Yun-A Shin[2], Kun-Ho Lee[3]

[1] Department of Adapted Physical Education, Dankook University, Republic of Korea
[2] Department of Prescription and Rehabilitation of Exercise, Dankook University, Republic of Korea
[3] Department of Sports Rehabilitation, Doowon University of Technology, Republic of Korea

Background: Obesity and overweight have been reported to affect the function of core muscles, with higher body mass index (BMI) associated with decreased balance ability. The bracing and hollowing breathing techniques are the most widely known methods to activate core muscles. This study aims to investigate the effects of different breathing techniques on lower limb muscle function and postural stability in overweight males and to develop core activation strategies for functional improvement based on these findings.

Methods: This study was conducted on 10 Overweight males(24±2.31 aged) in their twenties without back or musculoskeletal issues, the study involved pre-experiment training in both breathing techniques. It assessed maximal strength, endurance, and power during knee flexion and extension, alongside postural stability, with both eyes open and closed, using the non-parametric Wilcoxon signed-rank test for analysis. Statistical significance for all results was set at $p<.05$.

Results: Except for certain specific measurements (right flexor muscle maximal strength, left flexor muscle endurance, and right extensor muscle power), statistical analysis showed significant differences in Knee muscle function favoring the bracing technique ($p<.05$). While postural stability tests showed no significant overall differences between the bracing techniques.

Conclusion: Bracing breathing enhances lower limb strength, endurance, and power in overweight males, positively influencing muscle training more than the hollowing technique. However, in terms of postural stability, the hollowing technique may be more advantageous for tasks requiring high balance acuity, such as one-legged standing. In contrast, the bracing technique appears to be more effective for simpler stability tasks. These findings are thought to be due to differences in the muscle groups activated by each breathing technique and changes in the center of gravity caused by being overweight. Therefore, further detailed research considering posture and musculoskeletal influences is necessary.

PE 02-24 2. Nutrition, Education and Exercise for Obesity

Differential Regulatory Effects of Exercise and Hypocaloric Diet on Adipose Thermogenesis and Inflammation in Obese Mice

Shindy Soedono[1,3], Vivi Julietta[1], Eun Bi Ma[2], Yuha Joo[1], Maria Averia[3], Hadia Nawaz[3], Byung-Chul Oh[4], Chan Hee Lee[5], Joo Young Huh[2], Kae Won Cho[1,3]

[1] Department of Integrated Biomedical Science, Soonchunhyang University, Cheonan 31151, Korea
[2] College of Pharmacy, Chonnam National University, Gwangju 61186, Korea
[3] Soonhunhyang Institute of Medi-bio Science (SIMS), Soonchunhyang University, Cheonan 31151, Korea
[4] Department of Physiology, Lee Gil Ya Cancer and Diabetes Institute, Gachon University, College of Medicine, Incheon 21999, Korea
[5] Program of Material Science for Medicine and Pharmaceutics, Department of Biomedical Science, Hallym University, Chuncheon 24252, Korea

Background: Adipose tissue (AT) inflammation and thermogenesis are critical regulatory factors contributing to obesity-associated metabolic dysregulation. While diet and exercise are known to attenuate obesity, the impacts of a hypocaloric diet and exercise on weight loss-associated AT metabolism and their underlying mechanisms remain unelucidated. Here, we investigate the effects of equivalent weight loss induced by either exercise or calorie reduction on metabolic dysregulation, AT inflammation, and thermogenesis in obese mice.

Methods: Obese mice fed high-fat diets (HFD) were exercise trained (EX, n=8) or weight-matched to EX via caloric reduction (CR, n=8), and compared with ad libitum HFD-fed mice (Con, n=8). Metabolic parameters were assessed upon 8 weeks of exercise, and inflammatory indicators were examined using flow cytometry, histological analysis, and biochemical assays.

Results: EX and CR both reduced adiposity and improved glucose tolerance and insulin sensitivity. While EX and CR both reduced macrophage accumulation in AT, CR, but not EX, decreased circulating neutrophil and monocyte numbers. Gene expression analysis revealed that only EX significantly increased the expression of anti-inflammatory genes *Adipoq* and *Ym1* in visceral AT. EX also enhanced the expression of fat oxidation-related genes in visceral AT, including *Ppara*, *Pgc1a*, and *Acox1*. Additionally, EX upregulated thermogenesis genes in subcutaneous AT, including *Ucp1*, *Cidea*, and *Prdm16*.

Conclusion: Both EX and CR reduced AT inflammation, however, EX led to more robust changes in anti-inflammatory gene expressions, increased fat oxidation, and enhanced indices of thermogenesis function. Our findings indicate that exercise uniquely regulates AT function, which may be attributed to the metabolic benefits of exercise.

PE 02-25 2. Nutrition, Education and Exercise for Obesity

Enhancing the Completeness of Food and Nutrient Database (FNDB) for Processed Foods Based on the Nutrition Labels

Seohyeon Lee[1], Sung Ok Kwon[2], Jihyun Yoon[1,2], Cho-il Kim[1]

[1]Department of Food and Nutrition, Seoul National University, Seoul, Korea
[2]Research Institute of Human Ecology, Seoul National University, Seoul, Korea

Background: Although diet is the most important component in obesity management, nutrition label (NL) on processed foods in Korea lists only 9 nutrients, not enough for consumer's informed choice. To enhance the NL use, information on additional nutrients (AN) such as dietary fiber, added sugars and potassium is needed.

Methods & Materials: Based on the difference in nutrient list of NL between US and Korea, we attempted to secure AN information on the Korean processed food exported to US. After extracting relevant information from the USDA Global Branded Food Products Database, we performed web scraping/crawling to obtain product descriptions, nutritional information, ingredients, serving sizes, and images from the corresponding US websites of 2 major companies. Resulting data was compiled into a database and compared with domestic products using images, names, NL, etc. to verify identity.

Results: About 60% of the products examined turned out to be similar in image & name and 78% of them were matched well with calorie values within the variance allowed by US FDA and MFDS regulations. Paired t-tests on nutrient content/100g of the matched pairs showed no significant differences except for trans fat, due to different reference amounts, verifying the identity of the matched pairs. Information on AN was secured from the NL of the identical products in US.

Table. Nutrient content comparison between the matched processed foods in pairs

Nutrients	from Korean NL Mean (SD)	from US NL Mean (SD)	Difference Mean (SD)	*p* value
Energy (kcal/100g)	364.84 (145.27)	361.28 (145.71)	-3.57 (17.20)	0.137
Total Fat (g/100g)	13.27 (12.62)	12.74 (12.48)	-0.53 (2.32)	0.105
Saturated Fat (g/100g)	4.78 (3.55)	4.68 (3.64)	-0.10 (1.09)	0.522
Trans Fat (g/100g)	0.03 (0.09)	0.00 (0.00)	-0.03 (0.09)	0.042
Cholesterol (mg/100g)	4.91 (9.13)	3.08 (6.04)	-1.82 (7.78)	0.094
Sodium (mg/100g)	900.66 (586.46)	878.74 (590.62)	-21.92 (115.78)	0.174
Protein (g/100g)	6.59 (2.92)	6.55 (2.99)	-0.03 (0.90)	0.797
Carbohydrate (g/100g)	54.68 (20.47)	55.23 (21.32)	0.55 (2.74)	0.150
Total Sugars (g/100g)	7.10 (7.89)	6.99 (7.00)	-0.25 (2.61)	0.499

Conclusion: This method successfully complemented the AN information on processed foods in Korea. Enhancing the completeness of FNDB by predicting and/or estimating missing values with other approaches including big data-based machine learning and/or AI is warranted.

PE 02-26 2. Nutrition, Education and Exercise for Obesity

Analysis of News Articles on Physical Activity and Obesity among People with Disabilities: Application of Topic Modeling

Yena Bong[1], Yeokyung Suh[1], So-Yeun Kim[1]

[1]Department of Kinesiology and Sports Studies, Ewha Womans University, South Korea

Background: People with disabilities, who are also overweight or obese, face significant barriers to participating in regular physical activity due to physical, social, and environmental challenges. To manage obesity in this population, physical activity should be supported and monitored at a societal level. Analyzing news articles through topic modeling can reveal public awareness and opinions on these issues. Therefore, the purpose of this study was to identify trends and key themes in news articles related to physical activity and obesity or people with disabilities using topic modeling.

Methods: Using the Big Kinds search engine, a total of 7,166 online news articles from January 1990 to July 2024 were collected with specific keywords, such as "people with disabilities", "exercise", "sports", "physical activity", "obesity", and/or "overweight". From these, 243 relevant articles were selected. Topic modeling and text mining techniques were applied to identify major themes and keywords from these articles. The Coherence Score was calculated to determine the appropriate number of topics. All data processing was performed using Google Colab.

Results: The top 5 results of the TF(Term Frequency) keyword analysis are as follows: "Health", "Program", "Management", "Operation", "Rehabilitation". The top 5 results of the TF-IDF (Term Frequency -Inverse Document Frequency) analysis are as follows: "Classroom", "Rehabilitation", "Public Health Center", "Education", "Sports Center". A total of 10 topics were identified. After analyzing the relevant articles for each topic, topic names were determined: 1. Health Management and Prescription Strategies for Obese People with Disabilities, 2. Examples of Sports Club Operations for People with Disabilities Abroad, 3. Citizen Participation Cultural Sports Events, 4. Public Health Center Programs for Preventing Obesity in People with Disabilities, 5. University-Hosted Sports Camps for Families with Children with Developmental Disabilities, 6. Weight Management Programs for People with Chronic Disease, 7. Home Visits and Exercise Classes for People with Severely Physical Disabilities, 8. Community Projects for Health Promotion of People with Disabilities, 9. Physical Activity Programs for Inactive People with Disabilities, 10. Support for Weight Management among Employees with Disabilities at Standard Workplaces.

Conclusion: The analysis of news articles shows that support for promoting physical activity levels of people with various types and levels of disabilities, who are overweight or obese, has increased in both public and private sectors. To ensure that physical activity for people with disabilities becomes a regular part of ordinary life rather than a special or occasional task, easily accessible and inclusive events and programs should be expanded.

PE 02-27 2. Nutrition, Education and Exercise for Obesity

Dietary intake by obesity phenotype among young adults in Jeju

Youjeong Jang[1], Hyoju Lee [2], Kyungho Ha[1]

[1]Department of Food Science and Nutrition, Jeju National University, Jeju, Republic of Korea
[2]Department of Nutrition Education, Jeju National University, Jeju, Republic of Korea

Background: While body mass index (BMI) a common measure of obesity, it does not distinguish differences in body composition. Thus, this study aimed to investigate the association between dietary intake and obesity phenotype among young adults.

Methods: A total of 333 free-living adults aged 19–39 years residing in Jeju, were included in this study. Using bioelectrical impedance analysis (Inbody 770), Obesity was defined using both body mass index (BMI, ≥25 kg/m^2) and body fat percentage (≥25% for men and ≥30% for women). Obesity phenotypes were then categorized as normal, normal weight obese (NWO), high weight normal (HWN), and obese. Dietary intake was assessed using a 1-day 24-hour recall method.

Results: Among total participants, 28.5% were the NWO group with a higher body fat but normal BMI and 7.2% were in the HWN group with a higher BMI but normal body fat. 22.2% were defined as obese using both BMI and body fat. The NWO and obese groups tended to be females, whereas the HWN group tended to be males (P <0.0001). Physical activity level was highest in the HWN group (P <0.0001). The NWO group had the highest proportion of consuming below the estimated average requirement for vitamin B1 and iron (P < 0.05 for all). Fruit intake was significantly by obesity phenotype with a lowest intake in the NWO group (10.1 g) and a highest intake in the HWN group (60.1g) (P = 0.0381).

Conclusion: Dietary intake was different by obesity phenotype among young adults in Jeju and the NWO group showed a relatively poor nutritional status. Future prospective studies are required to investigate the role of diet in body composition changes in Koreans.

PE 02-28 2. Nutrition, Education and Exercise for Obesity

Effects of Lithospermum erythrorhizon extract on muscle function in adults older than 50 years of age: a randomized, double-blinded, and placebo-controlled trial

Qing Li [1], Eunwoo Yoo [2], Bokyung Shin [2], Haneul An [2], SeongHo Han [2]

[1]College of Medicine, Dong-a University, Korea,
[2]Department of Family Medicine, College of Medicine, Dong-a University, Korea

Background: Several previous studies have indicated that Lithospermum erythrorhizon extract(LEE) may have the ability to prevent skeletal muscle atrophy.

Methods: Therefore, we conducted a randomized, double-blind, and placebo-controlled study to investigate the effects of the LEE on muscle strength, muscle mass, muscle function, and metabolic markers in healthy adults; the safety of the compound was also evaluated. We examined the peak torque at 60°/s knee extension/flexion, handgrip strength, skeletal muscle mass, physical performance, and metabolic parameters at baseline, as well as after 0 and 12 weeks of intervention.

Results: Either 1000 mg of LEE or a placebo was administered to 100 healthy adults each day for 12 weeks; no differences in handgrip strength, muscle mass, and physical performance were observed between the two groups. However, the right-60°/s knee extension/flexion peak torque, the right-muscle power extension/flexion, and albumin concentration of subjects in the LEE group was found to be significantly better than that of subjects in the control group (P<0.05).

Conclusion: In summary, Lithospermum erythrorhizon extract may be useful in improving muscle function in adults older than 50 years of age.

Conclusion: Lithospermum erythrorhizon; muscle function; muscle strength

PE 02-29 2. Nutrition, Education and Exercise for Obesity

Effect of Resistance and Aerobic Exercise Program On the Cardio Metabolic Profile and Thyroid Function in Obese and Overweight Females with Subclinical Hypothyroidism.

Amrit kaur, Deepti wadhwa, Ganesh Msp

Physiotherapy, Maharashtra university of health sciences, India

Background: The Aim of this research was Comparing the effects of a 12-week combined exercise program including aerobic and strength training on thyroid function and cardio metabolic profile across groups of obese women and those with subclinical hypothyroidism.

Methods: The study comprised 24 women diagnosed with subclinical hypothyroidism, BMI ≥ 25 kg/m2, and TSH values within 5–10 mU/L in the previous 6 months. The group designated as obese consisted of 24 women who were obese and had a body mass index (BMI) of > 25 kg/m2 without hypothyroidism. Hormones related to thyroid function, body composition, blood lipid levels, and blood pressure (BP) were measured prior to and following the 12-week intervention in both groups. One week before the study began and one week after the twelfth training week ended was when the data was collected. Each workout was performed four times a week.

Results: After completing the 12-week training program, the BMI, body fat percentage, and systolic blood pressure of the subclinical hypothyroid group significantly improved (p 0.05), while the BMI, waist circumference, systolic blood pressure, and diastolic blood pressure of the obese group improved similarly (p 0.05). Blood lipid levels in the obese group differed statistically significantly from those in the subclinical hypothyroid group. The 12-week fitness training program had no discernible effect on thyroid-related hormones in either group.

Conclusion: An exercise training program did not have the same significant impact on blood lipids and thyroid-related hormones in patients with subclinical hypothyroidism. Further research is needed to determine whether exercise training can effectively alter thyroid hormones in patients with subclinical hypothyroidism.

PE 02-30 2. Nutrition, Education and Exercise for Obesity

Identifying Telehealth Competencies for Dietetics Education and Practice: A Path Toward Improving Health Outcomes for Patients Living with Obesity

Kendall Hess[1], Melissa Ventura-Marra[1], Amy Gannon[2]

[1]*Department of Animal and Nutritional Sciences, West Virginia University, USA*
[2] *Department of Dietetics, Marshall University, USA*

Background: STelenutrition has become instrumental in expanding access to nutrition care.1 Developing telehealth competencies (skills, knowledge, and behaviors) is paramount for ensuring safe and effective care.2 Competencies are established in medicine and nursing but are lacking in dietetics. This research aims to develop competencies to inform curriculum and practice. This initial research phase involves conducting a literature review to compile a preliminary list of competencies.

Methods: To identify peer-reviewed papers published in English between 2014 and 2024, the PubMed database was searched using (tele*[Title]) AND (competenc*[Title] OR skills [Title] OR curriculum [Title]) as the search string. A manual search of reference lists from review papers was also undertaken. Two authors screened titles, abstracts, and full-text articles and excluded those that were not relevant, did not provide a list of the competencies, or were opinion or guidance articles. Data were extracted from each paper based on The Guidance on Conducting and Reporting Delphi Studies checklist and included the following: author, publication year, country, profession, purpose, research methodology, and results.

Results: The PubMed search yielded 267 potential articles. After excluding those not meeting the inclusion criteria, nine articles were included (four from medicine, three from nursing, one from psychiatry, and one from allied health professions). Four papers were identified from the reference list of included papers. The competencies from the 13 articles were organized by theme and will serve as the initial list of competencies to be considered for incorporation into a modified e-Delphi study to gain expert-level consensus.

Conclusion: This research addresses a significant gap in dietetics training by identifying the necessary skills and knowledge to provide safe and effective telehealth services. The integration of telehealth competencies into the curriculum will prepare the workforce for the virtual healthcare landscape, improving patient care and management of diet-related chronic diseases such as obesity.

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PE 02-31 2. Nutrition, Education and Exercise for Obesity

Effect of Pumpkin (Cucurbita) Seeds supplementation on Body mass index, Blood pressure, and Hba1c level in patient with Metabolic Syndrome

Poonam Sahu[1], Dileep Kumar Verma[2], Narsingh Verma[3], Shyam Chand Chaudhary[4], Ranjana Singh[5]

[1,2,3] Department of Physiology, King George's Medical University, Lucknow, 226003, UP, India.
[4] Department of Medicine, King George's Medical University, Lucknow, 226003, UP, India.
[5] Department of Biochemistry, King George's Medical University, Lucknow, 226003, UP, India.

Background: The metabolic syndrome is the co-occurrence of risk factors including insulin resistance, type 2 diabetes mellitus, visceral obesity, atherogenic dyslipidemia, and high blood pressure. The use of herbal medicine as an alternative treatment is growing in patients with metabolic syndrome. This study aimed to assess the effects of pumpkin seed powder supplementation on Blood pressure (BP), Body mass index (BMI) and HbA1c level in patients with Metabolic Syndrome.

Methods: This study was conducted on 43 metabolic syndrome patients (22 case group (with pumpkin seed intervention) + 21 controls (without intervention). The patients were randomized to take pumpkin seed power(10gm/day) with standard conventional treatment and another group continued with standard conventional treatment only. BP, BMI and HbA1c assessments were completed in all patients at the baseline (beginning of enrollment) and after 3 months i.e., follow-up.

Results: The study participants had an average age of 47±7.05 years. There were no significant changes in study parameters at baseline of both the groups. HbA1c showed significant decrease (p=0.0112) in case group from baseline to follow-up. However, BMI (p = 0.6108), SBP (p = 0.1192) and DBP (p = 0.7771) did not show any significant change on comparing their respective baseline to follow-up in the case group. Moreover, in the control group, BMI (p = 0.4703), SBP (p = 0.4142), DBP (p = 0.1099) and HbA1c (p=0.2707), did not show any significant change on comparing their respective baseline to follow-ups.

Conclusion: The study concludes that Metabolic Syndrome patients show decrease in HbA1c level in case group from baseline to follow-up that show pumpkin seed supplementation may decrease the glycemic profile. Minor improvements in BMI & BP were noted but without significant changes. These findings emphasize that pumpkin seed supplementation might improve glycaemic profile, BMI and BP in metabolic syndrome patients.

PE 02-32 2. Nutrition, Education and Exercise for Obesity

A Self-perceived Proficiency of Endocrinologists and Trainees in Nutrition Before and After Nutrition Therapy Workshop

Katrina Marie Villamiel[1]

[1]Department of Medicine, the Medical City, Philippines

Background: Endocrinologists and primary care physicians are faced with challenges of limitations of time and expertise when dealing with patients with diabetes and obesity. A Nutrition Therapy Workshop was conceived by the Philippine College of Endocrinology Diabetes and Metabolism-Obestiy Lipid and Nutrition council (PCEDM OLN) out of a need to to equip endocrinologists with the proper use of nutrition therapy as a necessary tool to help manage and prevent common nutrition-related diseases, such as diabetes, obesity, dyslipidemia, hypertension, and malnutrition in the outpatient setting. Whether such learning workshops have an impact on knowledge, self-perceived proficiency in nutrition management attitudes and practices in nutrition therapy is not known.

Methods: We performed a survey to determine the self-perceived proficiency in nutrition among endocrinologists and trainees attending Nutrition Therapy Workshop and a focus group discussion to document challenges and best practices of endocrinologists in the Philippines when advising nutrition to patients with diabetes, obesity and hypertension. Questions on prior experience with nutrition workshops were answerable by yes or no; Self perceived proficiency questions, attitudes and practices questions were answered on a Likert scale of 1 to 5. A role playing workshop followed by focus group discussion was done by small group and learnings on challenges and best practices were synthesized in the plenary session.

Results: 48.6% of attendees were trainees (residents in internal medicine or fellows in training in endocrinology); The remaining 52.4% of participants were practicing endocrinologists. Majority of participants (79%) had heard of nutrition therapy prior to the workshop. Majority of respondents (71%) had not attended a Nutrition Workshop prior to this workshop. We observed an increase in the Likert score on the self-perceived proficiency from an average score of 3.26 on all 3 questions to 4.38; Attitude toward the importance of nutrition therapy was not significantly different pre and post workshop. The proportion of who would use nutrition therapy more than once a week in their practice increased compared to before the workshop (38% pre workshop to 84% post workshop). Challenges documented were divided in to Practice Gaps, Knowledge Gaps and Practical Challenges. Best practices identified varied from skill in developing rapport, shared decision making, empathy and person forward language.

Conclusion: Attendance in a nutrition therapy workshop improves self-perceived proficiency of endocrinologists and trainees in nutrition therapy; These may have an impact on attitudes on the use of nutrition therapy in clinical practice.

PE 02-33 2. Nutrition, Education and Exercise for Obesity

The Effect of a Multidisciplinary Lifestyle Intervention on Obesity Status, Body Composition, Physical Fitness, and Cardiometabolic Risk Markers in Children and Adolescents with Obesity

Sahil Arora[1], Rachna Khatri[2]

[1]Life Science, Lovely Professional University, India
[2]Medical Lab Technology, Niims University, India

Background: Globally, the prevalence of childhood and teenage obesity has risen during the last several decades.Prior research has indicated that childhood and teenage obesity raises the risk of cardiovascular disease (CVD) in childhood and adolescence as well as the incidence of metabolic syndrome (MetS) and CVD, including hypertension (HTN), Type 2 diabetes mellitus (T2DM), dyslipidemia (DL), and arteriosclerosis in adulthood.

Methods: 103 participants aged between 6 and 16 years (63 boys and 40 girls), with a BMI ≥85th percentile of age and sex-specific were assigned to receive either standard care or an exercise intervention for a period of 16 weeks. Overweight was defined as a BMI ≥85th percentile for age and sex, while mild to moderate obesity was defined as a BMI ≥25 kg/m2 or ≥95th percentile for age and sex, while severe obesity was defined as a BMI ≥35 kg/m2 or ≥120% of the 95th percentile

Results: The 103 individuals had a mean age of 12.56 ± 1.96 years, 38.8% of them were female, 34.0% had severe obesity, and 80.6% had a BMI ≥97th percentile for age and sex.Between the usual care and exercise groups at baseline, there were no significant differences in the proportion of severe obesity (31.0% versus 40.6%, p = 0.34) or the proportion of BMI ≥97th percentile for age and sex (81.7% versus 78.1%, p = 0.67).

Conclusion: In comparison to the usual care group, the exercise group had reduced percentages of body fat and cardio metabolic risk indicators after a 16-week multimodal lifestyle interventin,while their leg muscle strength and LM were higher. It is anticipated that education and circuit training activities will help obese children and adolescents improve their body composition,physical fitness, and cardio metabolic risk indicators

PE 02-34 2. Nutrition, Education and Exercise for Obesity

Impact of Obesity on Physical Function and Balance in Taekwondo Poomsae Athletes

Ye-Ji Kim, Ryu-Ri Song, Gwang-Yeol Baek, Sang-Jun Cho, Jeong-No Lee, Yun-A Shin[2]

[1]Department of Adapted Physical Education, Dankook University, Republic of Korea
[2]Department of Exercise Prescription and Rehabilitation, Dankook University, Republic of Korea

Background: In Taekwondo sparring, weight management is essential due to weight class competitions. However, in Poomsae competitions, the results are determined by the accuracy and expression of the movements, regardless of the athlete's weight. Consequently, Poomsae athletes do not manage their weight. However, obesity has been reported to decrease physical function and affect postural stability. Therefore, this study aims to investigate the impact of obesity on the performance of Poomsae athletes who do not manage their weight.

Methods: The study was conducted on 40 university Taekwondo Poomsae athletes (19.6±1.10 aged), measuring body composition, physical function (sergeant jump, 20m sprint), balance (center of pressure displacement, speed), and Poomsae performance (Geumgang and Pyongwon). The collected data were analyzed for differences between obese and non-obese groups using independent t-tests in Jamovi 2.5.6. Additionally, the relationships between the measured factors were analyzed using Pearson correlation. Statistical significance for all results was set at p<.05.

Results: There were no significant differences in physical function, balance, and Poomsae performance between the normal weight group and the obese group (Weight: 58.9±6.40 vs 72.1±5.94; BMI: 20.8±1.23 vs 24.7±1.48). However, weight showed a positive correlation with the sergeant jump (r=.448, p=.001) and a negative correlation with the 20m sprint (r=-.475, p=.002). Poomsae performance in Pyongwon showed a significant positive correlation with center of pressure displacement speed (r=.354, p=.027) and distance (r=.421, p=.008).

Conclusion: Body weight has been shown to be related to power and agility, but it did not have a significant impact on the performance of Taekwondo Poomsae athletes. These results are thought to be due to the athletes' learned motor control abilities from their existing training regimen and the fact that the athletes in the study did not have a high level of obesity. Therefore, further detailed research considering a wider range of obesity levels is necessary.